The Basics:
LaRC Technical Capabilities Overview

Areas of Technical Excellence

Materials - Polymers, Nanotubes, Composites, Multi-Functional, Thin Films,

Structures - Aeroelasticity/Flutter, Impact Dynamics and Damage Mitigation/Energy Absorbing, Fatigue and Fracture/Crack Growth, Radiation Shielding, Electron Beam Free Form Fabrication, NDE, Thermal Structures

Acoustics - Jet Noise, Flow Noise, Noise Propagation, Effects on Humans , Structural Acoustics

Aeronautics - "One Stop Shopping" except for Rotating Machinery Propulsion, Experimental and Theoretical; Aerodynamics across the speed range [subsonic to hypervelocity],General Aviation, Long Haul Transports [transonic and supersonic],Flight Dynamics and Control, Avionics, Air Traffic Control, Flow Control, Crew Human Factors, Safety. Reliable Software

Aerothermodynamics - Hypersonic Propulsion/Scramjets, Convective and Radioactive Heating, Aerothermo Chemistry

Sensors and Instruments - LIDAR, Space-Based, Non-Intrusive [passive and active]

Systems Analysis - Aviation/Aeronautics, Space Access, Spacecraft, Multi-disciplinary Optimization

Electromagnetics - Radar cross-sections, E-M Interference

Areas of Non-Aerospace Applications

Industrial Aerodynamics - "Street Canyons", HVAC, Other Transportation (Car/Train/Bus/Truck/Submarine), street lights/signs, trash cans, Building Design for Hurricane Loading, Shelter Belts, Wind Mills, Towers, Bridges, UAV's for Traffic Monitoring

Industrial Acoustics - HVAC Applications, Customer-Pleasing Appliances

Sensors/Instruments - Medicine, Building/Infrastructure NDE & "Health Monitoring", Safety/Security/Force Protection, HVAC

Energy, Warming - Composites for reduced weight (transportation), Flow Control for Drag Reduction, High Efficiency Thermal-Electric Conversion, Systems (including life cycle cost) Analysis of Alternative Energy sources and Conservation Approaches, Fuel Cell Membranes

The Basics:
Partnership Mechanisms

NASA offers several partnering options to accommodate the variety of circumstances presented by industry. While each mechanism has unique terms and conditions, all are designed to help U.S. industry get the most benefit from NASA's cutting-edge technologies and expertise.

Space Act Agreements are flexible agreements that allow NASA to work with cooperatively with industry and academia. The Space Act was established in 1958 (following the launch of Sputnik) to allow NASA to form unique partnerships in support of the Space Race.

CRADAs are essentially the same as a SAA, but provide the added benefit of allowing advanced licensing of technologies.

Cooperative Agreements are legal instruments used by a Federal agency to enter into a relationship whose principal purpose is to transfer something of value (usually funds and/or equipment) to the recipient to carry out a public purpose of support (usually joint research and development support). Cooperative agreements are basically the same as grants. Grants are used when substantial Government involvement is not contemplated; cooperative agreements are used when substantial involvement is contemplated. Thus, grants and cooperative agreements complement procurement contracts used for the very different purpose of acquiring goods and services.

Licenses – One of NASA's missions is to transfer the intellectual property created by NASA researchers in support of space exploration. NASA Langley owns over 2,000 patents and patent applications that protect inventions in hundreds of subject matter categories. NASA makes these inventions available to industry through its Patent Licensing Program.

Software Usage Agreements – Langley researchers are continually developing innovative and versatile software that are available and may be released into the public domain. Once approved for release, these software programs can be accessed through Software Usage Agreements and used in applications outside of their original NASA purpose.

SBIR/STTR Programs – These programs provide funding for U.S. small business and research institutions to produce scientific innovations that address NASA's needs. Annual SBIR Awards for Phase I is $100K and for Phase II (follow-on efforts) $600K.

Intergovernmental Personnel Act Mobility Program – These are assignments to or from state and local governments, institutions of higher education, and other eligible organizations to facilitate cooperation between the Federal government and the non-Federal entity through the temporary assignment of skilled personnel.

Standard Procurement – Based on the Federal Acquisition Regulations for simplified acquisitions.

The Basics:
Small Business Innovation Research Program (SBIR) and
Small Business Technology Transfer (STTR) Programs

Purpose: Provide funding for U.S. small businesses and research institutions to produce scientific innovations that address NASA's R&D Objectives.

For SBIR and STTR, the small business limit is 499 employees, though most have way less than that (single digits).
For STTR, the small business must partner with a Research Institution (often a university), and the RI must be responsible for 30% of the work.

Phase 1 SBIR = $100k for a 6 month effort (often a feasibility study for what will happen in Phase 2)

Phase 1 STTR = $100k for a 12 month effort

Phase 2 SBIR & STTR = $600k for 24 months (with deliverables – hopefully TRL 3-5 for the most part)

Phase 3 = any $$ amount and any length of performance. It can be awarded at any point after a Phase 1 or 2 is awarded (even before the Phase 1 or 2 is over or years after that work was completed). It is a sole source procurement vehicle as the Phase 1 and/or 2 processes satisfy the Competition in Contracting requirement. The funding for a Phase 3 does not come from SBIR funds - the program that wants the technology must fund it. Prime contractors can also use this vehicle to get to a small business without competing.

The **NASA SBIR & STTR Solicitation** is released the first week in July and closes in early September.

Website = www.sbir.nasa.gov

Frequently Asked Questions about Working with Langley

This section answers some of the basic questions about technology transfer, patent licensing, and privacy issues. Feel free to the Technology Gateway at http://technologygateway.nasa.gov for more information or please call (757-864-1178) for help.

Why is it important for Langley to transfer its technology?

The U.S. Congress and the NASA Administrator are putting great emphasis on transferring NASA-developed technology and expertise to U.S. industry to increase U.S. industrial competitiveness, create jobs, and improve the balance of trade. In addition, there is an emphasis on bringing technologies and expertise into NASA that can facilitate achievement of space program goals. NASA-developed technologies covered by a foreign patent application or patent are also transferred which enhance the interests of the Federal Government or United States industry in foreign commerce.

Will Langley assist an organization in solving its technical problems or improving its products?

If Langley has technology available that would be useful, the IPP would be pleased to discuss its possible applications. As one option, a collaborative effort could be conducted if NASA has interest in the research and if it has unique facilities and capabilities to contribute.

What types of collaborative partnerships will Langley participate in with a company?

Langley offers several collaborative partnership options to accommodate the variety of circumstances presented by industry. The four most common types of working relationships are:

- License a NASA-patented technology directly
- Use unique Langley facilities for company research
- Participate in a shared-resource project that supports and stimulates advanced research and technology developments
- Collaborate on the development of a technology to benefit a company product and /or to address a NASA mission need

Collaborative partnerships might be formalized as a Space Act Agreement (SAA), a Cooperative Research and Development Agreement (CRADA), or a Cooperative Agreement. While each mechanism has unique terms and conditions, all are designed to help U.S. industry get the most benefit from NASA's aeronautic space program.

What is the difference between license agreements and partnership agreements?

License agreements are used to grant exclusive, partially exclusive, or non-exclusive rights to use a Langley technology. Additional support to facilitate the transfer of technology and know-how can also be provided by Langley—this support would be granted through a collaborative partnership agreement.

Available Technologies

How does NASA market its technology?

We use a variety of marketing tools, according to what is most effective for the situation. The most common are the following:

Technology Opportunity Sheets—One-page announcements succinctly presenting the technology and its potential applications and benefits

Web sites— Some technologies can only be fully understood with many details, which are best presented online. A searchable listing of technologies is available on "TechFinder" http://technology.nasa.gov/)

Industry briefings—Meetings hosted by NASA to present related technologies and partnership/licensing opportunities

Trade show exhibits—Displays and/or presentations that introduce technologies available for partnership/licensing.

NASA Tech Briefs—A monthly magazine containing brief announcements of new technologies. (http://www.techbriefs.com/)

Whom do I contact to receive further information on a particular Langley technology?

Specific contact information is provided for each technology. Or you can contact the Technology Gateway by telephone at 757-864-1178.

Partnership Agreements

What's the difference between an SAA, a CRADA, and a Cooperative Agreement?

SAAs and CRADAs are essentially the same. Authorized by the National Aeronautics and Space Act of 1958 (as amended), SAAs are flexible arrangements that allow NASA to work cooperatively with industry and academia. A CRADA, authorized under the Technology Innovation Act of 1980, is a contract entered into by one federal and one non-federal entity in order to facilitate sharing of specific joint research and development. Unlike the SAA,

advanced licensing of inventions made by NASA employees can be granted to the industry partner under a CRADA. Cooperative Agreements with profit-making firms allow Langley to enter into a cost/resource-sharing arrangement for research and technology development.

Do I need to know what kind of partnership agreement I want?

No. It is not necessary to specify the type of partnership desired. In fact, Langley will determine which agreement vehicle is best based upon the specifics of the request.

How long does it take for a partnership agreement to be negotiated and signed by NASA officials?

Usually about 2-4 weeks excluding the company's processing time.

Can collaborations begin before the partnership agreement is officially signed?

Certain activities (e.g., non enabling technical discussions) can occur prior to signing the agreement.

What can Langley contribute and what can my organization contribute (i.e., money, man-hours, materials, facilities, and services) under a partnership agreement?

Langley can contribute nearly all of these items; however, it cannot transfer appropriated funds to the partner. The partner can contribute all of these items. The contributions of each party are negotiated by Langley and the partner.

Who receives patent rights to technologies developed under a partnership agreement?

Industry or academia may retain the rights if the technology is invented solely by its employees. Langley may retain the rights if the technology is invented solely by Langley employees. A jointly owned patent will result if employees of each party invent the item. In any event, patent rights will be spelled out in the agreement or negotiated in accordance with applicable law.

Can industry, academia, or individuals use Langley facilities? If so, how do I find out what Langley facilities are available to industry? Is there a charge for the usage?

Langley facilities can be used on a space-available basis. Should the research to be conducted be of interest to NASA, Langley may cover some of the expenses

for joint efforts of mutual interest. However, the cost depends on the facility, staff and time required for effort. A list of the facilities can be found at http://gis-www.larc.nasa.gov/masterplan/section5/buildings.html.

Can I buy some software from NASA? What is the cost and how do I go about acquiring it?

NASA does not sell software. Some software is available for licensing through the commercialization activities NASA engages in, but much of it is freely available. Free software is provided under a software usage agreement specifying the rights and restrictions conveyed to the recipient. Some software may be released into the Open Source community, or into the Public Domain. Most available software will be released under agreements that allow commercial activities, but not resale or redistribution of any portion of the software itself. These agreements are non-exclusive.

Patent Licenses

Will Langley grant an exclusive license for a particular NASA technology(ies)?

Yes. Langley offers several types of exclusivity: exclusive, co-exclusive, exclusive in a particular field of use or in a geographic region. Regardless of type of exclusivity, the license applicant must meet specific criteria required in the Code of Federal Regulations (CFR) under the heading "Licensing of Government Owned Inventions" at Title 37, Part 404 in order to be considered for granting exclusivity. Other factors taken into account are the business plan and the organization's demonstrated wherewithal to carry it out.

What other types of license agreements are available? What happens if another company is interested in the same technology that I want to license?

A company may apply for a nonexclusive or one of the exclusive types of licenses mentioned above. Langley requires interested companies to submit a business plan with the license application for the particular technology. If another company is interested in the same technology, Langley will determine the best licensing arrangement to accommodate each company's area of interest. If, however, the companies are requesting exclusivity for the exact same licensing space, then Langley will select the license applicant best positioned to expedite and maximize the utility of the technology.

How long does the patent licensing process take?

The process generally takes about 3 to 4 months after receipt of the Patent License Request and Business Plan for a nonexclusive license. Exclusive licenses take longer and are highly dependent on the complexity of the application. The time frame for exclusive licenses includes a mandatory waiting period of 15 days, during which time a member of the public can file a written objection.

What upfront fee and percentage in royalties does Langley require under a license agreement?

Our licensing program requires an up-front fee (typically due upon execution of the license), a running royalty based on net sales, and a minimum annual royalty. All NASA licenses are individually negotiated depending on the type of license requested and a number of other factors. The running royalty is based on, but not limited to, the maturity of the technology, the value of the intellectual property, and market comparisons. It is likely to be somewhere in the vicinity of 3 to 8 percent of net sales. Typically, our up-front fees are based on one year's worth of expected royalty at steady state.

Privacy Issues

Are discussions with Langley personnel kept confidential? What about the Freedom of Information Act (FOIA)?

Langley personnel are obligated by law to keep all proprietary information confidential if identified as such. Specifically, under 18 U.S.C. 1905 (Trade Secrets Act), NASA civil servant employees are subject to criminal prosecution for wrongful disclosure of confidential and/or proprietary information. Conviction under this statute can result in a fine of $1000, a one-year prison sentence, and removal from office. Company trade secret information revealed to Langley in the process of developing, negotiating, and signing a partnership agreement is exempt from FOIA.

What information can Langley personnel provided me before my company needs to enter into a confidentiality agreement?

Langley personnel may conduct non-disclosing technical discussions and provide publicly available information. Confidentiality agreements are prepared by Langley for signature by the party authorized to bind the company in such agreements.

Must the data resulting from a partnership with Langley be made public?

Partnership agreements can contain their own nondisclosure and IP ownership clauses based on what is appropriate for each arrangement.

Must the data resulting from the work in a Langley facility be made public?

If the user pays the total cost associated with use of the facility, the data will not be made public unless otherwise agreed to. However, if the research to be conducted is of interest to NASA and Langley covers some of the expenses, then the results could eventually be publicly released by NASA.